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AUTHOR Gower, Linda A.; And Others
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ABSTRACT

Rapoport and Chammah's (1965) Prisoner's Dilemma (PD) game research and Vinacke's (1959) parchisi board game research revealed that players used various strategies to reach their desired outcomes. The researchers ascribed the strategy variations to gender differences. A study was conducted which replicated Vinacke's parchisi board game and Rapoport and Chammah's PD game to determine whether the gender differences reported in the literature still exist, and to examine their relationship to achievement motivation. Twenty-eight male and 24 female undergraduates participated in the PD game; 36 males and 36 females participated in the parchisi board game. Although the intensity of gender differences was not the same as that reported 25 years ago, the replication study revealed that gender differences in strategy choices still existed. Similar to the data reported in the past, females tended to choose a noncooperative strategy in the PD game, and a cooperative strategy in the parchisi game; whereas, male strategy choices were reversed. A theory of resultant achievement motivation as an explanation for the apparent reversal of game strategies within genders was not supported. It was concluded that, while gender differences were real, given the methodology used, they could not be explained through motivation. (NB)

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Game Strategies: Gender differences vs. Motivational Differences

by

Linda A. Gower & Dr. Steven G. Cole

Texas Christian University

& Dr. J. L. Phillips

Oklahoma State University

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RUNNING HEAD: Game Strategies

Abstract

Although the intensity of gender differences was not the same as reported 25 years ago, a replication of Rapoport and Chammah's (1965) Prisoner's Dilemma (PD) game and the Vinacke (1959) parchisi board game revealed that gender differences in strategy choices still exist. Similar to the data reported in the past, females tended to choose a noncooperative strategy in the PD game, and a cooperative strategy in the parchisi game; whereas, male strategy choices were reversed. A theory of resultant achievement motivation as an explanation for the apparent reversal of game strategies within genders was not supported. It was concluded that, while gender differences were real, given the methodology used, they cannot be explained through motivation.

Game Strategies: Gender differences vs. Motivational Differences

Individuals participating in research in which the dyadic Prisoner's Dilemma (PD) game (e.g. Evans & Crumbaugh, 1966; Rapoport & Chammah, 1965) or the triadic parchisi board game (e.g. McGaffey, 1976; Vinacke, 1962) has been played have been found to use various strategies to reach their desired outcome. Some researchers (e.g. Rapoport & Chammah, 1965; Vinacke, 1962, 1969) have ascribed the strategy variations to gender differences. However, as reported by Vinacke (1969), the observed game-playing behavior for both the PD and parchisi board games are not consistent with what would be expected based on the gender differences explanation. While Vinacke suggests that the problem lies with demand characteristics inherent in the PD game which, he says, do not provide a wide enough scope within which gender differences can express themselves; Phillips and Cole (1970) suggest that, instead the problem lies with the reliance on gender differences to explain game-playing behavior. We agree with Phillips and Cole that the apparent inconsistencies in the PD and parchisi game results can be explained by Atkinson's (1957) theory of achievement motivation. Regardless of

gender, some individuals in a competitive situation are motivated by a desire to win and others are motivated by a desire to avoid losing.

One study (McGaffey, 1976) has examined and presented support for the Phillips and Cole hypothesis in a probabilistic triadic mixed-motive game in which achieved power was relevant; however, no studies could be found that examined both the PD and the deterministic mixed-motive game represented by the parchisi board game. Thus, the present study replicated the Vinacke parchisi board game (Vinacke, 1959) and the PD game (Rapoport & Chammah, 1965) to determine whether the gender differences reported in the literature still exist, and to examine their relationship to achievement motivation.

Method

Subjects

Participants were undergraduate Psychology students at Texas Christian University. Twenty-eight males and 24 females participated in the PD game. Thirty-six males and 36 females participated in the parchisi board game. Participants earned class credit by volunteering for the study.

Procedure

The PD game was conducted in the same manner as the Rapoport and Chammah (1965) PD game except that Apple II computer terminals were used to present the game matrix and record participant's choices.

The parchisi board game was conducted in the same manner as the Vinacke (1959) board game. A 31" x 33" game board with 90 spaces plus a "start" and "home" space was used. Participants played six games, three each of two power combinations (i.e. 1-1-1 and 2-3-4). These power combinations were chosen for the present study because, of the six power combinations used by Vinacke, these two conditions showed the most pronounced gender differences.

Results/Discussion

The results of the PD game indicated the Rapoport and Chammah (1965) study was replicated. Overall mean percentage of cooperative choices in the Rapoport and Chammah (1965) study was 34% for females and 59% for males.

(Figure I)

When mean percentages of individual cooperative choices in the present study was broken down by blocks of 10 plays each, results revealed females made cooperative

choices 18.3% of the time while males chose the cooperative option 23.7% of the time. In the present study, as in the Rapoport and Chammah (1965) study, no tests of statistical significance were performed. The point of interest was instead, in the direction of tendencies of strategy choices.

The results of the board game indicate the Vinacke (1959) study was also replicated.

(Figure II-A, II-B)

Coalition formation behavior in both the Vinacke (1959) and the current study revealed a tendency for females to form more triple alliances while males formed more two-person coalitions. When no coalition formation and triple alliance behavior were combined, results here, as in the Vinacke study, revealed that females tend to ally less often as pairs against a third player. Vinacke's findings, as well as those in the current study, did not reach a statistically significant level when Chi-squares were calculated.

In order to examine game playing behavior from a motivational viewpoint, resultant achievement motivation scores were calculated for each subject. The determination of high and low resultant need-achievement was based on norms developed over 2500 TCU freshmen in the

last three years. It was hypothesized that, for the dyadic PD game, low need-achievement (N-Ach) people (those motivated by a desire to avoid losing) would make fewer cooperative choices than people who had a high N-Ach score (those who are motivated by a desire to win).

(Figure III)

However, when the mean number of individual cooperative choices was calculated, low N-Ach people made more cooperative choices than high N-Ach people, up to the 70th trial. It appears that after that point participants may have begun to develop a strategy that, if allowed to continue over more trials, would support the hypothesis. Rapoport and Chammah (1965) found that tendencies do not emerge at first, but reveal themselves as the game progresses.

(Figure IV)

Also, when double cooperative choices were compared by N-Ach, low N-Ach people cooperated to a lesser degree than did high N-Ach people which is what would be expected according to our hypothesis. Double cooperative choices were examined by Rapoport and Chammah (1965) as further support for their gender difference hypothesis. It is believed that for the current study, an examination of double cooperative choices by resul-

tant need-achievement would give an indication of the results which might be revealed if participants were matched for high and low resultant need-achievement scores.

While the results obtained in the current study indicate that resultant achievement motivation cannot provide a complete explanation for PD game strategy, a look at the trend of cooperative choices by High and Low N-Ach people shows a strong indication that matching participants' N-Ach scores and extending the number of trials might result in stronger evidence that resultant achievement motivation can be an appropriate explanation for game playing behavior.

Motivation does not seem to account for the different strategies used in the parchisi board game either. According to the stated hypothesis, low N-Ach people should insure against loss by forming more triple alliances and fewer two-person coalitions than high N-Ach people. But, in the present study, the same number of triple alliances were formed by both N-Ach groups and low N-Ach people actually formed more two-person coalitions than did high N-Ach people. When no coalition formation and triple alliance behavior were combined, both groups chose those strategies with almost identical

frequency whereas, the hypothesis would lead one to expect a higher incidence of such behavior among low N-Ach people than high N-Ach.

One possible explanation for a lack of support of the stated hypothesis may be that the deterministic nature of the coalition formation game situation is not an environment which brings out the motivational aspect of the competition. McGaffey's (1976) contention that a task must be achievement-oriented for its motivational aspects to be aroused gains support by these results. McGaffey goes on to state that the Vinacke parchisi game does not constitute such a context.

Examination of the data in the current study revealed that males and females still use different strategies in the PD and parchisi experimental game situations. While the achievement motivation hypothesis did not prove to be an adequate explanation of differences in game playing behavior; results do suggest that further revision and refinement of the experimental methodology could provide support for that hypothesis and should be continued.

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FIGURE I

INDIVIDUAL COOPERATIVE CHOICES - BY GENDER

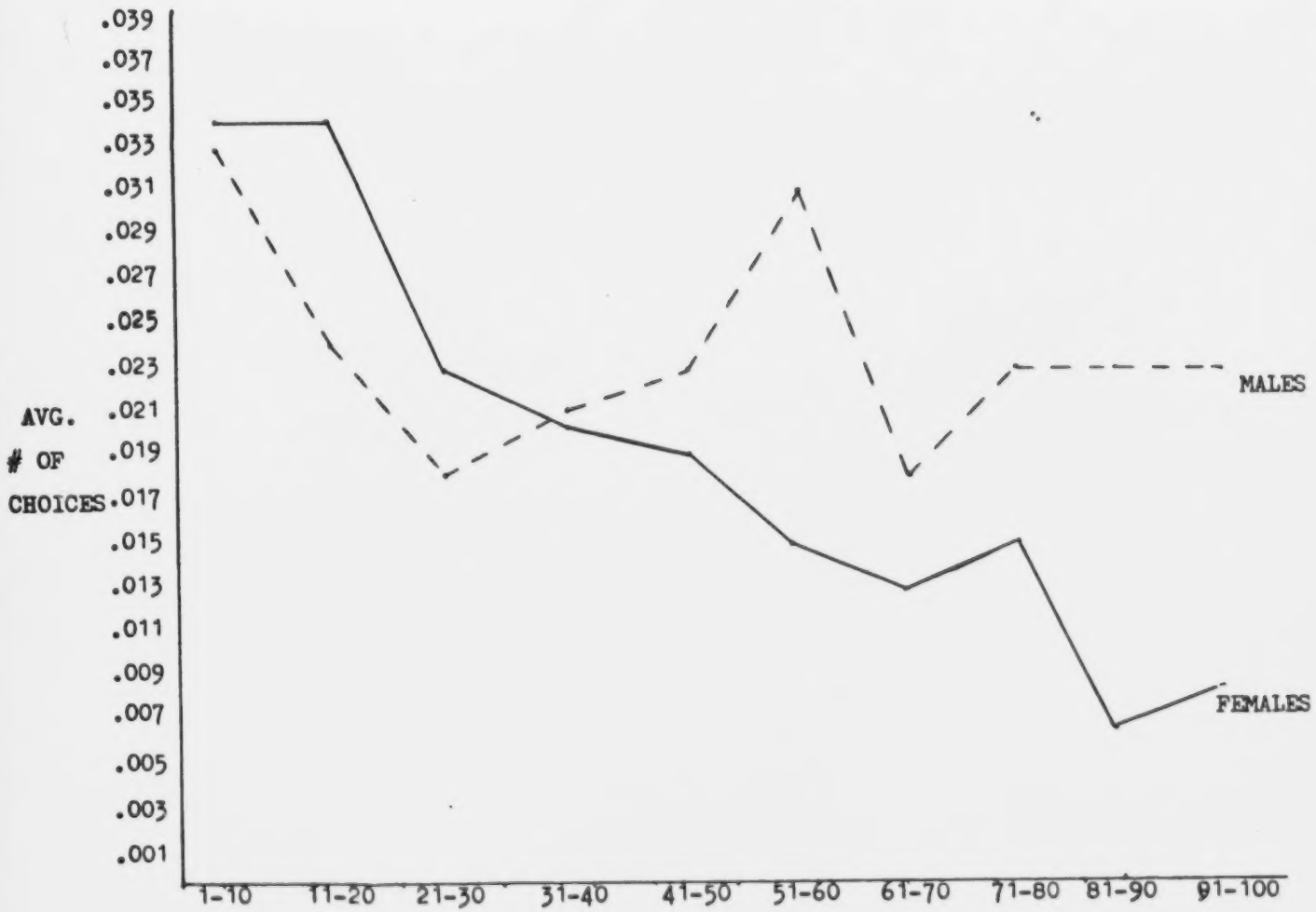

FIGURE II-A

TRIPLE ALLIANCES BY GENDER

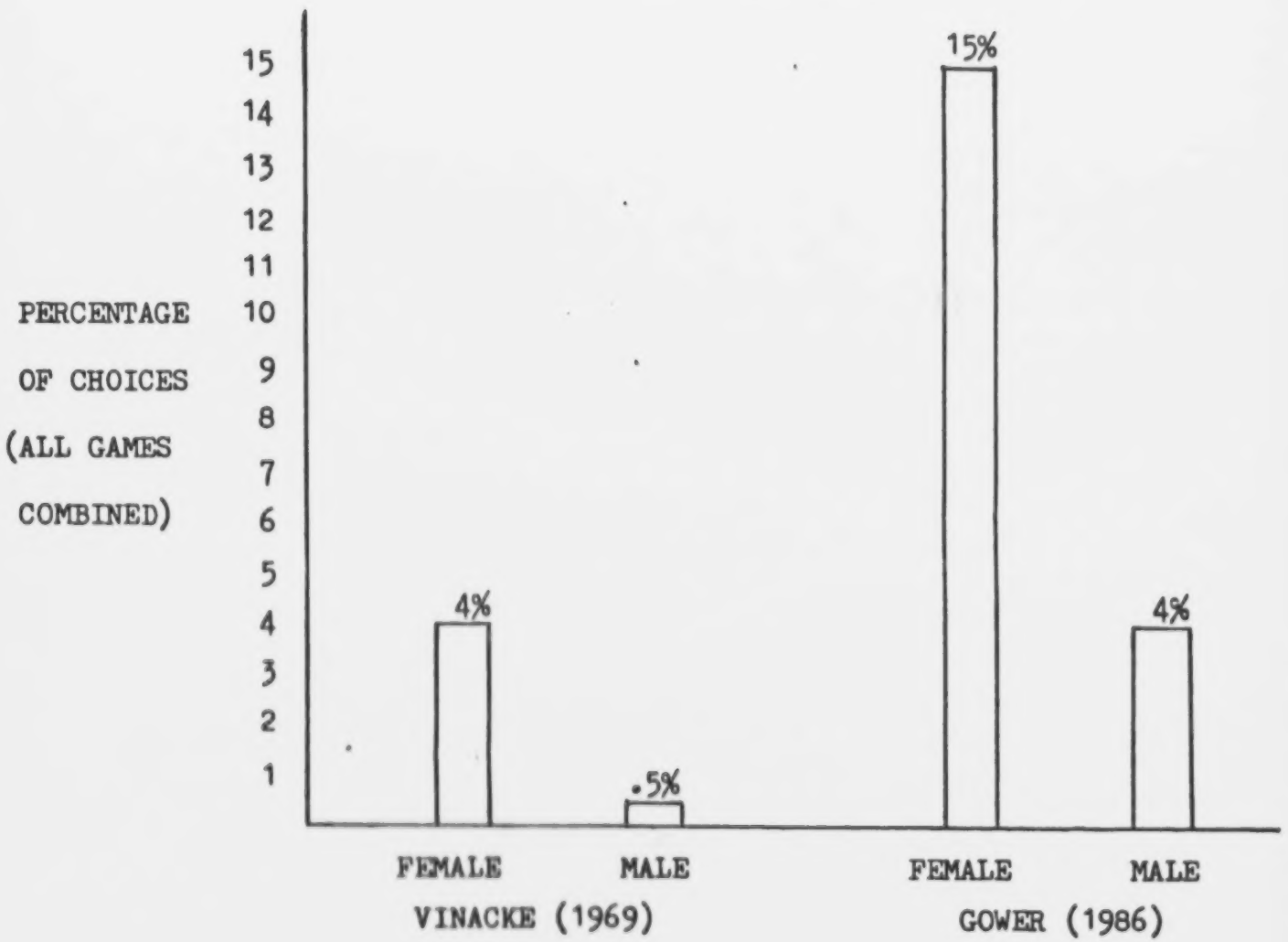

FIGURE II-B

TWO-PERSON COALITIONS

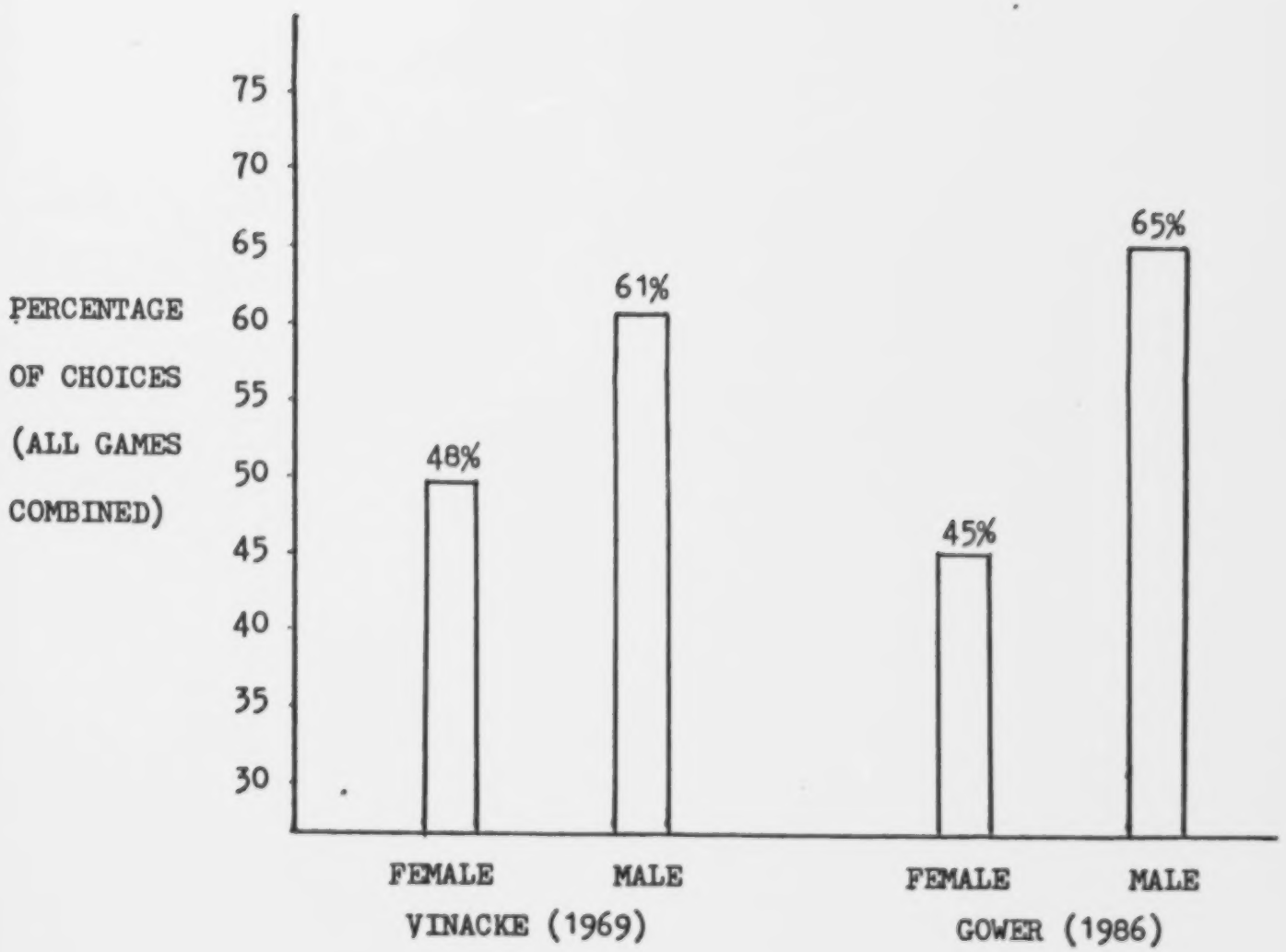

FIGURE III

INDIVIDUAL COOPERATIVE CHOICES - BY N-ACH

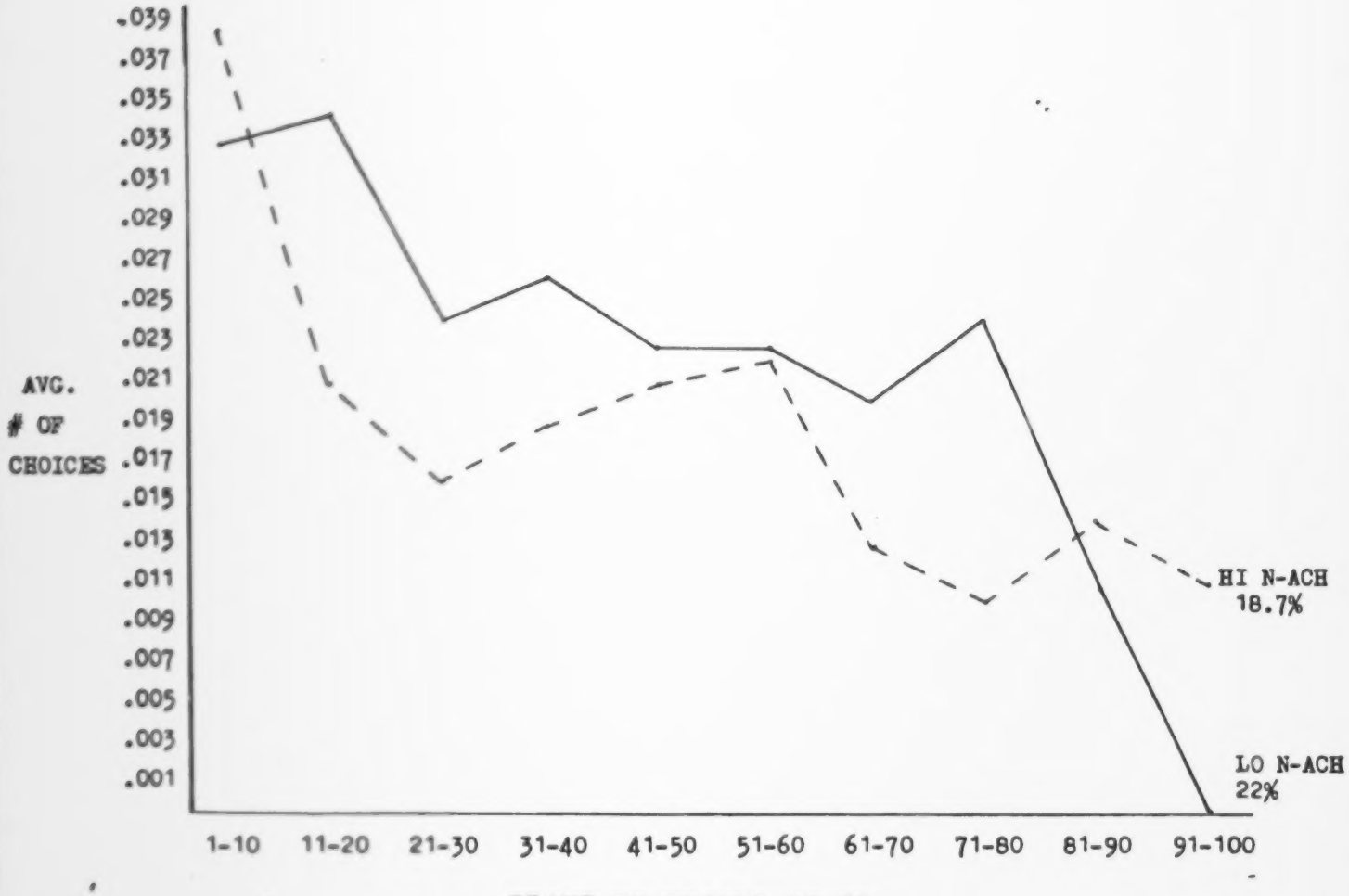

FIGURE IV

DOUBLE COOPERATIVE CHOICES - BY N-ACH